REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars:

Objections to the specification

The specification is presently objected to for certain informalities. In particular, the examiner notes that reference number 1 from Figures 1 and 2 is not defined in the specification, and that reference number 20 is used to designate both the "XY dimensional platform" and the "Z dimensional platform" at lines 13-14 of page 8.

The specification has been amended to use the reference number "1" in reference to the substrate discussed at lines 1-2 of page 8.

The specification is also amended to refer to a "Z-dimensional positioning platform 30" at line 14 of page 8, which is consistent with a subsequent reference to the "Z-dimensional positioning platform 30" found at line 6 of page 9.

In view of the amendments to the specification, withdrawal of the objection is requested.

Rejection of claim 6 under 35 U.S.C. § 112, second paragraph

Claim 6 presently stands rejected as being indefinite. In particular, the examiner notes that the recitation of "said discharging planar electrode" in line 1 of claim 6 lacks sufficient antecedent basis.

Claim 6 has been amended to recite "said discharging electrode" instead of "said discharging planar electrode," and also to depend from claim 5.

In view of the amendment of claim 6, withdrawal of this rejection is requested.

Rejection of claims 1-9 under 35 U.S.C. § 103(a)

Claims 1-9 presently stand rejected as being unpatentable over Nakayama et al (U.S. 6,719,602, hereafter Nakayama) in view of Smalley (U.S. 5,591,312). This rejection is respectfully traversed for at least the following reasons.

Claim 1 is amended to more clearly describe that the reference level is above a surface of the substrate on which at least one carbon nanotube is formed, wherein the shortest vertical distance of the top of said carbon nanotube above said reference level is H. Claim 1 further provides that a discharging electrode is positioned so that the vertical distance from said discharging electrode to said reference level is I, and that H is not less than I. The substrate is moved with a positioning platform so that the nanotube is cut by the discharging electrode.

It can be recognized that, according to this arrangement, the nanotube intersects the discharging electrode, since the distance H of the end of the nanotube above the reference level is not less than the distance I of the discharging electrode above the reference level. State differently, the nanotube simply extends above the discharging electrode so that the nanotube intersects with, and is therefore cut by, the discharge electrode.

Nakayama and Smalley fail to disclose or suggest such an arrangement. Nakayama discloses an arrangement wherein a gap exists between a discharge needle and the tip of a nanotube, such that a distance I between the discharge needle and any reference level corresponding to that of the present invention is ***greater*** than the distance H of the tip of the nanotube above such a reference level.

In other words, construing the position of the discharge needle and the tip of the nanotube of Nakayama in similar terms as the present invention, H is less than I. This is contrary to the presently claimed invention, wherein as set forth in claim 1, ***H is not less than I***.

Smalley discloses a method for producing fullerene fibers by establishing an electric field between a needle electrode and an opposing electrode in the presence of carbon and a heat source (see *Smalley*; Abstract). However, Smalley does not teach or

suggest cutting a carbon nanotube with a discharging electrode. Instead, Smalley is related to "growing," not cutting, the fullerenes.

Therefore, neither Nakayama nor Smalley, nor any combination thereof, discloses or suggests the presently claimed invention as set forth in claim 1. Accordingly, it is respectfully submitted that claim 1, and claims 2-9 which depend from claim 1, are allowable over the cited references.

Turning to claim 4, it is respectfully submitted that claim 4 is allowable over the cited references because, in addition to its dependency from claim 1, claim 4 recites that the substrate is a silicon wafer or glass substrate. It is respectfully submitted that neither a silicon wafer or glass substrate is disclosed or suggested by either Nakayama or Smalley. It is respectfully submitted that the examiner's conclusory, yet unsupported, assertion that "one of ordinary skill in the art would recognize that it is obvious that an AFM probe be made of silicon" is insufficient to form a prima facie case of obviousness of claim 4. The examiner has offered no reason or supporting evidence as to why it would be obvious that an AFM probe be made of silicon.

Turning to claims 5 and 6, it is respectfully submitted that Nakayama does not disclose or suggest a discharge electrode for cutting a nanotube that is a planar or a wire electrode. It must be appreciated that, according to Nakayama, it is only the ***tip end*** 28 of the discharge needle 22 that discharges a current which melts the tip end 17 of the nanotube. Therefore, it is incorrect to construe the discharge needle 22 as a planar or a wire discharge electrode that cuts a nanotube. The planar electrode 20 does not cut a nanotube, and only the tip end of the discharge needle 22 is involved in melting of a nanotube.

Turning to claim 9, it is respectfully submitted that Nakayama does not disclose or suggest both the claimed voltage range and the claimed pulse period. Nakayama notes that "in the second embodiment, a pulse power supply P is used ***instead of*** the direct current power supply E." (Nakayama; col. 4, lines 56-58) (emphasis added). Nakayama does not provide any teaching or suggestion of what pulse period is used, or of what

voltage is to be used when a pulsed power supply is substituted for the direct current supply.

It is respectfully submitted that Nakayama and Smalley together fail to provide any necessary teaching or suggestion for a person of ordinary skill in the art to arrive at particular combination of voltage range and pulse period range set forth in claim 9. Nakayama does not provide any teaching of any particular pulse period, and teaches that the applied voltage is dependent on the gap between the tip end 28 of the discharge needle 22 and the tip end 17 of the nanotube 10 (see *Nakayama*; col. 4, lines 13-25). However, the present invention there is no such gap, and therefore the teachings of Nakayama are not applicable.

Moreover, it is respectfully submitted that there is no motivation or suggestion for the combination of Nakayama and Smalley. While Nakayama is concerned with shortening a carbon nanotube, Smalley is concerned with growing fullerene fibers. The shortening of a carbon nanotube and the growing of a fullerene fiber are, even construing the fullerene fiber to be a carbon nanotube, entirely opposite processes, and therefore it is respectfully submitted that persons of ordinary skill in the art would not look to a process for growing a fullerene fiber to modify a process for shortening a nanotube in order to arrive at a method for cutting (controlling the length of) a nanotube.

In view of the foregoing remarks, it is respectfully submitted that Nakayama and Smalley fail to form a prima facie case of obviousness of the presently claimed invention, and therefore claims 1-9 are allowable over the cited references. Accordingly, withdrawal of the rejection is requested.

Conclusion

In view of the amendments to the claims, and in further view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that claims 1-9 be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's attorney, the Examiner is invited to contact the undersigned at the numbers shown.

Respectfully submitted,

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